A Simple Approach to Physician Entry of Patient Problem List

Harm J. Scherpbier, M.D.[1], Richard S. Abrams, M.D.[2], David H. Roth[1], Jennifer J.B. Hail[2]

[1] SMS, Malvern, Pennsylvania

[2] Rose Medical Center, Denver, Colorado

ABSTRACT

The patient's problem list is one of the key components of the electronic medical record. Besides the immediate benefits of using the patient problem list for medical records coding and creation of discharge documentation, a coded problem list is a prerequisite of patient management, clinical decision support and research. The ICD9 coding system that is the current standard for coding diagnoses and procedures is not conducive to physician usage. In this paper we describe a simple system that provides physicians with a quick and easy method to enter and maintain a patient's problem list. Physicians can use their own terminology. ICD9 codes are included where possible, but free text is allowed. The system strikes a balance between capturing a fully coded patient problem list and encouraging usage by a wide physician user group.

INTRODUCTION

Previous studies have shown that the ICD9 coding system and the English descriptions in ICD9 do not meet physicians' needs for maintaining a patient problem list[1,2]. Yet, despite its shortcomings to express a clinically accurate problem list, ICD9 remains the coding system of choice in many institutions because of reimbursement and billing. We set out to create a system that gives physicians freedom of expression in entering the patient problem list while maintaining the link to ICD9 codes.

The system described here was developed at Rose Medical Center (RMC), a 420-bed acute care facility with 1,100 physicians in Denver, Colorado. RMC is part of a health care network that includes primary care sites, outpatient surgery facilities and a home health care network. It is a teaching hospital affiliated with the University of Colorado Health Sciences Center. RMC uses an IBM mainframe based HIS with a PC-based Graphical User Interface on the physicians' desktops. The electronic medical record presently contains data from lab, nursing, radiology, transcription, pharmacy, as well as financial data.

The problem list system is part of a larger set of functions that assist physicians in the discharge of patients. Besides entering the patient's problem list, the physician can build discharge prescriptions on-line starting with the patient's current inpatient medications. The system also assists the physician in filling out the appropriate discharge forms (nursing home transfer forms, home health care forms, etc.). Although this system began as part of the discharge functions, it has evolved to become part of the admission functions. Besides speeding up chart completion, the computer-based problem list plays an important role in the communication between clinicians.

SYSTEM REQUIREMENTS

To encourage physicians to enter the patient's problem list, we set out to design a system that would meet the following requirements:

1. Provide physicians with a short picklist of frequently used diagnoses[3].
2. Allow physicians to add, change and delete diagnoses on the picklist without the assistance of Information Systems staff.
3. Allow physicians to use their own terminology[1, 2, 4].
4. Provide a link between physicians' personalized descriptions and ICD9 codes.

To satisfy requirement 1, we needed to define a short picklist. The standard screen size in the Clinical Information System can easily accommodate 36 selection items. We studied which percentage of discharge diagnoses used by physicians during one year would be covered by 36 diagnoses. Figure 1 shows that 36 diagnoses covered 73.4% of discharges for the group of internists at Rose Medical Center

0195-4210/94/$5.00

between March 1, 1993, and March 1, 1994. For an individual member of this group, 36 diagnoses covered 99.3% of discharges during the same period. For the department of General Surgery, the same group vs. individual comparison does not show the same increase of coverage for the individual: coverage for the group is 67.4%, for the individual 64.9%.

clustering by body location does not have the same effect in Internal Medicine that it has in General Surgery, it does increase the coverage. With the introduction of two diagnosis clusters (Diabetes and Myocardial Infarction), 99.3% of discharges are covered by 29 diagnoses, compared to 36 without clustering.

These results show that a short picklist needs to

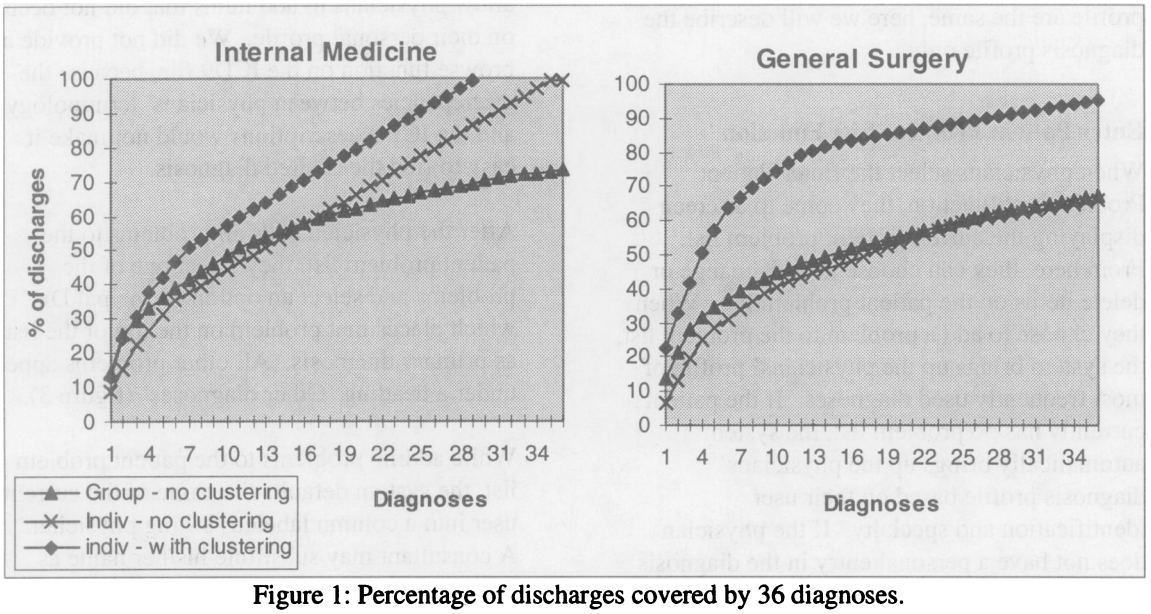

Figure 1: Percentage of discharges covered by 36 diagnoses.

One of the reasons that the coverage for General Surgery is lower than for Internal Medicine is the fact that ICD9 codes are different if the same disease occurs in a different location in the body. Since Internal Medicine focuses more on systemic diseases, the effect of location on the number of ICD9 codes used is smaller. To increase the coverage of 36 diagnoses for General Surgery, we introduced the concept of clustering. By using diagnosis clusters, we can count all hernias as one diagnosis group rather than one for each different site. Similarly, one can combine all benign neoplasms, malignant neoplasms, cellulitis, intestinal obstructions, etc. Clusters not only serve to increase the number of diagnoses covered, they also help organize the picklist in a logical manner, following the physicians' pattern of thought.

Figure 1 demonstrates the effect of clustering in General Surgery. Thirty-six diagnoses for an individual surgeon covered 95.3% of discharges in the period covered. Although the effect of

rely on individualization and clustering to get a good rate of coverage. We added the following two items to the other four requirements for the system:

5. Individuals can build and maintain a personalized list of frequently used diagnoses, without the intervention of Information Systems staff.
6. The system supports clustering of diagnoses, allowing for a second level of selection of body site for a given diagnosis.

DESIGN

The system is designed around two profiles. The first profile, the Diagnosis Profile, contains a set of 36 diagnoses, each with a slot for the ICD9 code, and a pointer to a cluster of subclassifications. The second profile, the Subclassification Profile, contains clusters of diagnoses. There is no limit to the number of subclassifications for a diagnosis cluster.

Physicians can create and maintain their personal copy of the diagnosis profile without Information Systems staff assistance, using functions described below. The sub-classification profile is standard across the institution and maintained by Information Systems personnel.

The same structure is maintained for procedures. Each physician can have a personalized list of diagnoses and a list of procedures. Since the design and the functions for the diagnosis profile and the procedure profile are the same, here we will describe the diagnosis profile only.

Enter Patient Problem List Function

When physicians select the Enter Patient Problem List function, they come to a screen displaying the current patient problem list. From here, they can choose to add, change or delete items on the patient problem list. When they choose to add a problem to the problem list, the system brings up the physicians' profile of most frequently used diagnoses. If the patient currently has no problem list, the system automatically brings up the physicians' diagnosis profile based on their user identification and specialty. If the physician does not have a personal entry in the diagnosis profile, the system displays the set of frequently used diagnoses for the physician's specialty.

From the physician's diagnosis profile, they can select one or more items and add them to the patient's problem list (figure 2). If a selected item is a clustered diagnosis, the system displays all members in that cluster. The physician can select one or more cluster members from the subclassification profile to add to the patient's problem list.

Once the selected items are added to the patient's problem list, the physician has the option to accept the new patient problem list. They can also manually add additional diagnoses or problems using free text. Although free text selections are not ICD9 coded, they allow physicians to add items that did not occur on their personal profile. We did not provide a browse function on the ICD9 file, because the discrepancies between physicians' terminology and the ICD9 descriptions would not make it easy to find the desired diagnosis.

After the physician adds all problems to the patient problem list, they select one of the problems and select an option 'Principal Dx,' which places that problem on the top of the list as primary diagnosis. All other problems appear under a heading 'Other diagnoses' (figure 3).

While adding problems to the patient problem list, the system defaults the name of the current user into a column labeled 'billing physician.' A consultant may substitute his/her name as billing physician on appropriate diagnoses. This helps avoid situations where two physicians bill Medicare patients for the same diagnosis and only one of them receives reimbursement.

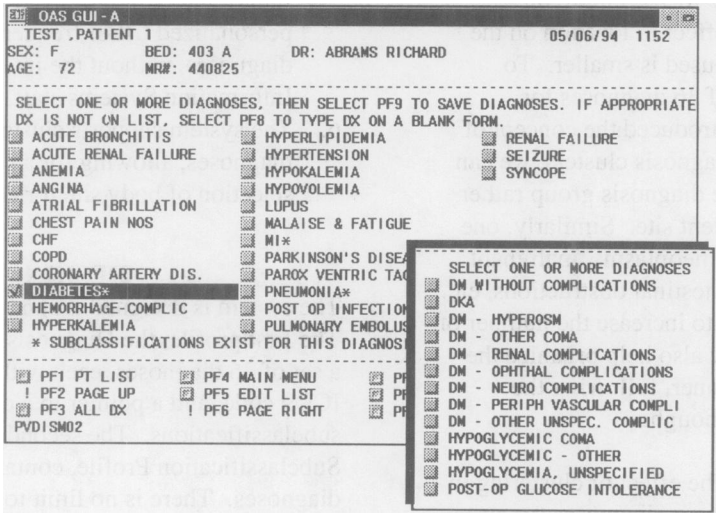

Figure 2: Diagnosis Profile Selection Screen. Insert: Subclassification selection for diagnosis cluster 'Diabetes.'

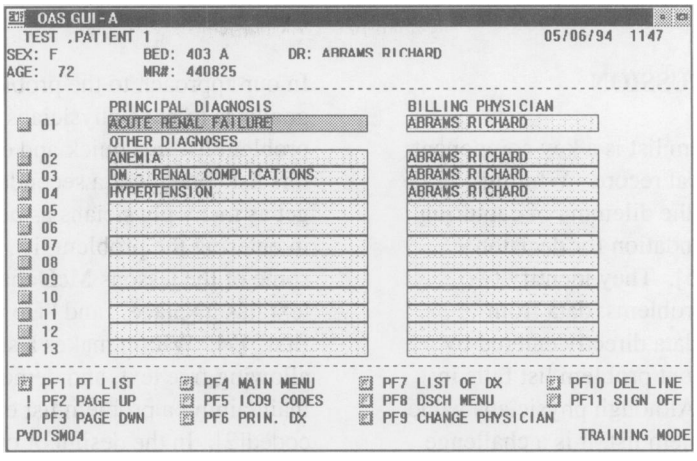

Figure 3: Patient Problem List - Editing Screen.

Medical Records coders review and complete the physician entered patient problem list during the patient's stay. They add any complicating and comorbid conditions, and enter the estimated length of stay for each of the patient's diagnoses. When necessary, coders communicate with physicians by phone, E-mail or paper mail.

Personalize List

Physicians can create a personal copy of the set of frequently used diagnoses by copying the specialty list. Once they have created a personal copy, they can delete existing items, change the description of existing items, or add new items. When adding new items, one can choose an option to enter the ICD9 code for the new item. It is recommended that physicians enter the ICD9 code to facilitate the concurrent coding by Medical Records staff. Physicians can sort their list alphabetically or leave the list as entered.

Edit List

Once users have created a personal list, they will automatically see their own list when entering a patient problem list. At any time, physicians can edit their personal list, using the same functions to add or delete items, or to change the description of existing items. For example, physicians prefer to use the term "FUO" (Fever of Unknown Origin) over the ICD9 description "Pyrexia of undetermined etiology."

The system can be set up to prohibit deletion of entire diagnosis clusters without assistance of Information Systems personnel.

EXPERIENCES

The system described here has been in use by a number of physicians since March 1994. One of the main benefits of the system is the addition of the problem list as essential component of the electronic medical record. The problem list facilitates communication among physicians, consultants, nurses and others treating the patient, and makes them less dependent on the manual medical record.

The second important benefit, and the incentive to the physician to enter the problem list, is the automatic creation of discharge documentation. The discharge forms include the patient problem list as entered by the physician and supplemented by medical records coders. The ability for medical records staff to complete the coding during the patient's stay, without searching for elusive charts, speeds up chart completion and reduces the number of cases involving patient diagnoses that the medical records coder needs to consult with the physician about. This in turn shortens the billing cycle.

Because of the option to add billing physician to the patient problem list, the system helps avoid rejection of reimbursement by Medicare if multiple physicians bill under the same diagnosis.

We are in the process of measuring physician compliance, usage of the option to individualize the picklist, and effects of the computer problem list on chart completion.

DISCUSSION

A coded patient problem list is a key component of the electronic medical record. Whiting-O'Keefe *et al* identify the dilemma of capturing clinical data as the foundation for decision support and research [5]. They identify two types of data capture problems: data from ancillary systems and data directly entered by the clinician. The patient problem list falls in this second category. Although physicians value a computer-based problem list, it is a challenge to get a large number of physicians to enter it into the computer [4]. The system described here aims to provide physicians with a quick and easy method to enter a patient's problem list. The purpose is to achieve short-term benefits, such as improved physician communication, quicker chart completion and the automatic creation of discharge documentation, as well as to achieve the long-term goal to provide source data for clinical decision support and research.

To circumvent some of the problems associated with physicians' use of the ICD9 coding system, we created a buffer structure that allows physicians to use their own terminology and still maintain the link to an ICD9 code where possible. We provided physicians with a short picklist of frequently used diagnoses, and demonstrated that such a list can cover the majority of diagnoses used by personalizing the list and allowing users to cluster certain diagnoses into groups.

Franco *et al* describe a different method to present the physician with a short picklist when entering the patient problem list [6]. They use an expert system to base the short selection list on patient data rather than on physician characteristics. Deriving the problem list with an expert system from patient data has strong appeal in a finite domain with sufficient structured data. In a wider domain, where the essential patient data is not available at all or not in computer readable form, one has to rely on physician charateristics to create a short picklist. The expert system approach may be applied to code complicating and comorbid conditions during the patient's hospital stay, when sufficient structured data is available.

In our approach to the problem list, the primary goal was to have physicians enter the patient problem list in a quick and easy way. Getting this list coded was a secondary goal. In order to get as many physicians as possible to participate in entering the problem list, we incorporated some of the lessons McDonald learned: "Free text has its place", and "Do the easiest things first" [7]. Wilton makes a strong case for allowing free text, and demonstrates the value of maintaining a problem list even if it's not fully coded[2]. In the design of our system we traded off a fully coded problem list that would be used by a minority of physicians against a problem list that may include free text but is conducive to physician usage. Rather than creating the ideal coding system, we've created a way to make the current, unsatisfactory system work better. We realize that the next step is to create a fully coded patient problem list that would be used by all physicians for all patients. To paraphrase Voltaire, we have taken the simple approach: "Don't let the best be the enemy of the good."

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